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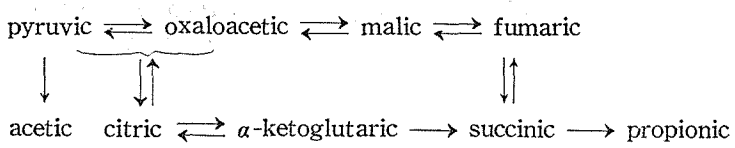

24. Relation of the Drugs Acting on the Autonomic Nervous System to the Effect of Analgesics

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In order to investigate the above mentioned theme, the effect of various drugs in combined use with drugs acting on the autonomic nervous system was studied using a modification of Hardy's radiant heat technique in man.

The pain threshold elevating effects of (I) Morphine, (II) Dolantin, (III) Ohton (1,1-Dithienyl-3-dimethylamino-butene-1), (IV) *l*-Ephedrine, (V) *dl*-Desoxyephedrine, (VI) *d*-Isolan (3.4-Methylendioxyphenyl-isopropylamine), (VII) Benadrin (Diphenhydramine), (VIII) Parpon-M (Dimethylaminoethylbenzylate) and (IX) Avacan-M (Isoamyl ester of α-[N-(β-Dimethylaminoethyl)] -Aminophenylacetate) were markedly reduced by Priscolin or Regitine (adrenolytics), and also by Prostigmine (cholinergics). On the contrary, they were potentiated by *l*-Ephedrine or *d*-Desoxymethylephedrine (adrenergics). For example, Figs. 1 and 2 show the influence of various autonomic drugs to VII and II respectively. (Curves represent average of the

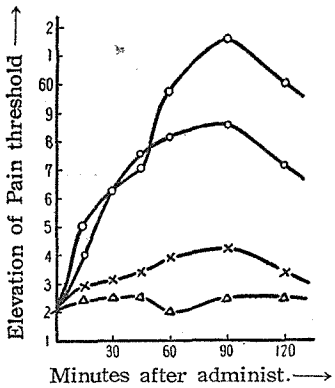

Fig. 1. —○—,(VII 25mg.+IV 25mg.) P.O.
—●—,VII 50mg. P.O.
—×—,(VII 50mg.+Priscoline 50mg.) P.O.
—△—,VII 50mg. P.O.+Prostigmine 0.5mg. S.C.

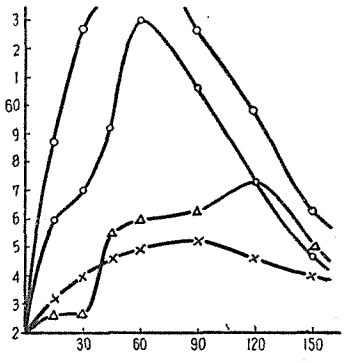

Fig. 2. —○—,(II 50mg.+IV 50mg.) P.O.
—●—,II 50mg. P.O.
—△—,II 50mg. P.O.+Prostigmine 0.5mg. S.C.
—×—,(II 50mg.+Regitine 50mg.) P.O.

second pain threshold for 6 subjects by cross-over test).

Compounds (I)~(IX) were used as hydrochloride. It is well known that II, III, VII, VIII and IX indicate the anticholinergic properties, while IV, V and VI possess the adrenergic effects.

From the above results, it can be readily supposed that the analgesic effect of these drugs has a close connection with their adrenergic (sympathomimetic) as well as anticholinergic (Parasymatholytic) properties.